

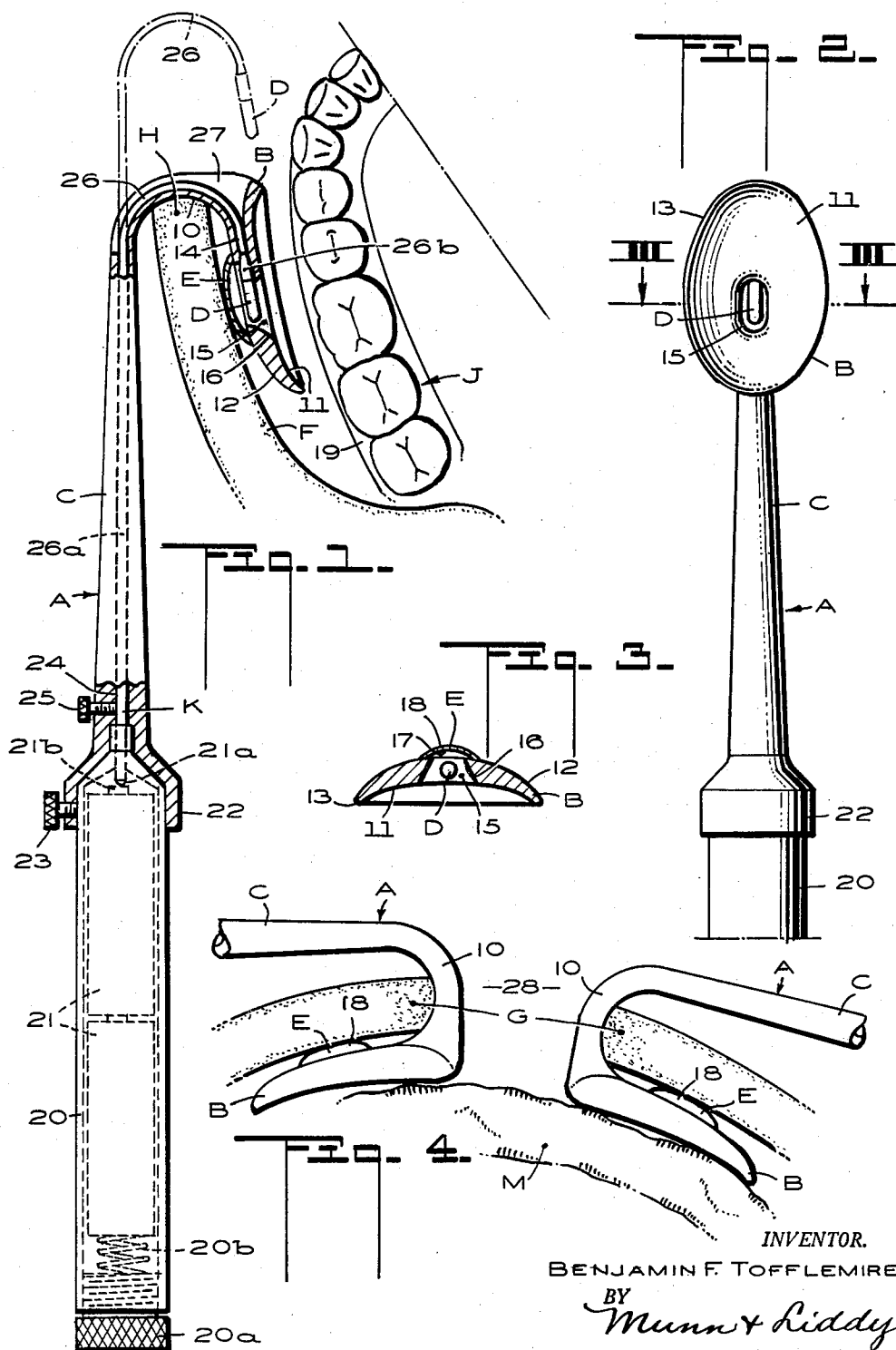
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B. F. TOFFLEMIRE

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LIGHT-DIRECTING SURGICAL RETRACTOR INSTRUMENT

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INVENTOR.
BENJAMIN F. TOFFLEMIRE
BY
Munn & Riddy
ATTORNEYS

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LIGHT-DIRECTING SURGICAL RETRACTOR INSTRUMENT

Benjamin F. Tofflemire, Lafayette, Calif.

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2 Claims. (Cl. 128—11)

The present invention relates to improvements in a light-directing surgical retractor instrument. It consists of the combinations, constructions and arrangement of parts, as hereinafter described and claimed.

It is a well-known fact that the function of surgical retractors, in their generally accepted use, is the holding and traction exerted upon the edges of surgically-incised tissues, causing a dilation or spreading of these edges, thereby providing greater accessibility and visibility for the surgeon and operating team.

This retracting function, also, might include the spreading or holding of non-incised tissues away from the site of the surgery, in order to provide greater accessibility and visibility, such as the holding of the buccal tissues away from the alveolar area in oral surgery.

Retractors have long been used in surgery in various parts of the body; and they usually consist of a hook, which is shaped to conform to the edges of the tissues to be retracted or drawn apart. These retractors further include a handle portion which is angularly related to the hook in such a manner that the assistant can apply traction in the direction needed and, at the same time, be in such a position as to afford the surgeon substantially unobstructed view of the operative field.

However, there has been one outstanding shortcoming in the design and function of surgical retractors in the past, and this is the absence of an on-the-spot source of artificial illumination. Frequently the hook of the retractor must be submerged deeply in the various body cavities, which are devoid of light. For example, in abdominal surgery, the hook of the retractor may curve beneath superimposed organs and tissues, which often obscure the outside light which is being directed toward the operative field by directional lighting. The actual site of the operative work is confronted with confusing shadows in the deeper portions and a masking surface glare, which tends to blind the operative vision at the actual site of the involved surgery. Of course, similar situations prevail in thoracic, inguinal, renal and oral surgery.

An object of my invention is to provide a surgical retractor which has a spoon portion having a very compact, miniature electric lamp incorporated within its spoon, without adding bulk or otherwise detracting from the functional value of the retractor itself. Thus an on-the-spot source of artificial illumination is provided in the operative field.

Moreover, during traction, the light-directing function of the instrument is always available whenever and wherever needed. The direction and elevation of the light may be further influenced by the assistant simply tilting or slightly rotating the handle of the retractor, if needed, for example, in deep visceral surgery. In other words, my improved retractor directs the light where it is needed, and the illumination thus provided is not subject to shadows, and no blinding glare is present to distract the surgeon.

Other objects and advantages will appear as the specification continues. The novel features will be particularly set forth in the claims hereunto appended.

Drawing

For a better understanding of my invention, reference should be had to the accompanying drawing, forming part of this specification, in which:

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Figure 1 is a horizontal plan view of my light-directing surgical retractor instrument, partly in section, and disclosing it as being used for holding the buccal (cheek) tissues of the patient away from the alveolar (that part of the jaws in which the teeth are set);

Figure 2 is a fragmentary front elevational view of the retractor;

Figure 3 is a transverse sectional view taken through the spoon portion of the instrument, along the line III—III of Figure 2; and

Figure 4 illustrates a pair of my retractors as being used in connection with an abdominal operation.

While I have shown only the preferred form of my invention, it should be understood that various changes, or modifications, may be made within the scope of the annexed claims without departing from the spirit thereof.

Detailed description

Referring to the drawing in detail, my light-directing surgical retractor instrument has been designated generally at A. In its structural features, the instrument includes a spoon portion B having a handle C secured thereto by a curved section 10. This spoon portion is shaped to conform to the edges of the tissues to be retracted; while the handle is angularly related to the spoon so that an assistant can apply traction without obstructing the surgeon's view of the operative field.

As shown in Figures 2 and 3, spoon portion B is generally oval-shaped in marginal outline, defining a concave front face 11 and a convex rear face 12. It will be noticed that the retractor spoon has smooth and rounded marginal edges 13, which are designed to conform to the tissues being retracted.

For the purpose of providing direct illumination to the operative field, a small electric lamp D has been inserted into a socket 14 fashioned in the spoon portion B. The light rays emanating from this lamp pass through an aperture 15, which is fashioned in the central portion of the spoon. This aperture is funnel-shaped, flaring outwardly in the direction of the concave face 11 of the spoon, that is, toward the site of the surgery. The peripheral wall 16 defined by this aperture provides a protective guard over the lamp D, preventing accidental breakage of the latter in the event of an unavoidable impact in the course of the operative procedure. However, the aperture permits the free passage of light rays to the locale of the surgery being performed.

For the purpose of reflecting light from the lamp D through the aperture 15, a reflector E is mounted on the spoon B rearwardly of the lamp. The inner concave surface 17 of this reflector is preferably parabolic in shape to thus direct parallel rays of light through the aperture. As shown in Figures 1 and 4, the outer convex surface 18 of the reflector is adapted to bear against the buccal tissues F and the abdominal tissues G, respectively. The reflector provides a closure over the aperture 15 at the rear face of the spoon portion B, thereby precluding tissues of the patient from being pressed into the aperture from the rear of the spoon portion.

It will be apparent that both the direct and the reflected rays will pass through the orbit-like aperture 15, and the rays will illuminate the field of operation. The handle C may be readily tilted or rotated to follow the course of the surgeon's operative procedure.

With particular reference to Figure 1, wherein for the purpose of illustration only, my light-directing surgical retractor has been applied over the cheek H of the patient's mouth so as to withdraw the buccal tissues F from the alveolar 19 in which the teeth J of the lower left quadrant are set, it will be obvious that the spoon B provides an extensive dome-like canopy over the field

of operation. These tissues may be held away from the site of the operation; and, at the same time, the operative field will be flooded with a non-glaring light, without casting shadows.

As shown in Figure 1, ample space is afforded by the concave face 11 for rotating surgical burs, diamond wheels or stones, where they may be operated without any likelihood of entangling surrounding and contiguous tissues. In operative dentistry, the spoon B permits the cheek to be held away from abutting the grinding stones and diamond wheels employed by the dentist.

Of course, any suitable means may be provided for furnishing the necessary electrical energy to the lamp. For this purpose, a casing 20 has been shown for housing one or more dry cell batteries 21. The handle C may be fashioned with an enlarged socket 22 at its lower end, into which the upper end of the casing 20 may be removably inserted. In order to anchor the handle to the casing, a set-screw 23, or other suitable fastening means, may be provided.

It will be noted that a metal conduit K has been shown as extending from the batteries to the lamp. The electrical circuit may include an insulated wire enclosed within the conduit, and having a terminal 21a at its lower end arranged to engage with the central contact 21b of the uppermost battery. This wire may extend to the filament of the lamp D. The other side of the electrical circuit may be provided by grounding the lamp D and the batteries 21 to the socket 14 and the casing 20, respectively.

As shown in Figure 1, the conduit K may be projected downward in a bore 24 fashioned lengthwise in the handle C, with a set-screw 25 removably anchoring the conduit in place, wherein the terminal 21a and the contact 21b will remain in engagement. This conduit is substantially J-shaped and defines a curved portion 26 which is adapted to be accommodated in a groove 27, the latter being fashioned in the upper part of the curved section 10 of the retractor to extend between the bore 24 and the socket 14. Thus, when the set-screw 25 is loosened, the conduit K and its lamp D may be withdrawn to allow the latter to be replaced, as suggested by the dot-dash lines in Figure 1 of the drawing. The conduit has a straight stem 26a telescoped into the bore 24, and further has a tip 26b disposed in the socket 14. The conduit K and the lamp D may be withdrawn as a unit through the groove 27 at the top of the instrument.

It will be noticed that a cap 20a is removably threaded into the lower end of the casing 20 to allow the batteries 21 to be inserted or removed from the casing, with a coil spring 20b being inserted between the cap and the batteries. When this cap is partially unscrewed, the central contact 21b of the upper battery will be separated from the terminal 21a to thus extinguish the light. In other words, the cap 20a serves as a switch in the electrical circuit.

Although the source of current has been disclosed in the drawing as being provided by dry-cell batteries so as to have a self-contained instrument, it is obvious that the current could be supplied from the lower voltage transformer in the operating room or dental unit. However, the battery-powered instrument may be used during power-shortage emergencies, and may be readily stored in a cabinet or the surgeon's bag, available when needed. The transformer-powered unit requires an extension cord. Either type of current supply is dependable and efficient.

It will be observed from Figure 4 that a pair of my light-directing surgical retractors A have been applied to the opposing edges of an incision 28, which has been made in the abdominal tissues G. These retractors may be pulled in opposition directions to expose the organs M to thus give the surgeon a clear view of the operative field, which will be illuminated by the lamps carried by the spoon portion B.

The instrument thus provided has been designed so as

to have the retractor portion, which is defined by the spoon B and the handle C, free from objectionable bulk or irritating projection of material in contact with the patient's tissues, thereby making the instrument equally applicable for surgery done under general anesthesia, or regional block or infiltration obtundents. The handle portion C is angularly attached to the spoon B in such a manner that the most efficient traction can be exerted, in the required planes, with the minimum of effort and fatigue on the part of the assistant, and with a minimum of compartment obstruction or interference with the entire visual field of the surgeon. Moreover, the light-directing mechanism is so compactly designed that it does not add materially to the over-all bulk of the instrument.

I claim:

1. In a light-directing surgical retractor instrument: a spoon portion having a handle secured thereto to project therefrom; the spoon portion and handle providing a retractor which is engageable with a patient's tissue to retract the latter to expose an operative field; the spoon portion defining front and rear faces which are concave and convex, respectively; a socket provided in the spoon portion between these faces; a lamp mounted in the socket; the spoon portion being formed with an aperture in front of the socket and extending from the lamp to the front face of the spoon portion, with the aperture being positioned for the passage of light therethrough from the lamp to thereby illuminate the operative field forwardly of the front face of the spoon portion, while the tissue is held in retracted position; said aperture being funnel-shaped and flaring outwardly towards the front face of the spoon portion, with the peripheral wall of said aperture providing a protective guard in front of the lamp, which is disposed to prevent accidental breakage of the lamp in the event of an unavoidable impact in the course of operative procedure; and a reflector mounted in back of the lamp and being secured to the spoon portion to provide a closure over the aperture at the rear face of the spoon portion, thereby precluding the patient's tissue from being pressed into the aperture from the rear of the spoon portion.

2. In a light-directing surgical retractor instrument: a substantially J-shaped handle, defining a stem provided with a curved section at one end; a spoon portion secured to the curved section; the spoon portion having front and rear faces; a lamp socket provided in the spoon portion between these faces; the spoon portion being formed with an aperture extending from the lamp socket to the front face of the spoon portion; the handle having a conduit-receiving bore extending lengthwise through its stem; said curved section having and open groove fashioned therein at one end of the instrument; said groove extending from said bore to the socket; a substantially J-shaped metallic conduit having a straight stem telescoped into said bore of the handle, and further defining a curved portion removably accommodated in said groove; the conduit having a tip portion provided with a lamp, the latter being disposed in the socket of the spoon portion in registration with said aperture; and a source of electrical power connected through the conduit to the lamp for lighting the latter; said conduit and lamp being withdrawable as a unit through said groove at the curved section of the handle.

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